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NEW AND LITTLE KNOWN MALAYAN RHYNCHOTA (HEM. HOMOPT.)

By N. C. E. Miller, F.R.E.S., F.Z.S.

Typhlocolpura (Bredd., 1900, *Rev. Ent.*, **19** : 195).

Typhlocolpura chinai sp. n. (fig. 1, *a–g*).

Colour. Greyish black. Eyes brown. Apical segment of antennae, except for a narrow annulation basally, light brown. Membrane of hemielytra, trochantera, basal half of femora, light brown. Apical angle of connexivum with a brownish ochreous spot. Area surrounding trichobothria on abdomen ventrally, black. Rostrum brown. Setae fulvous. *Structure.* Basal segment of antennae robust, thicker than remaining segments; surface of segments except 4, rugulose punctate; surface of 4, smooth except for a narrow annulation at base, rugulose punctate. Length of segments: 1, 2·1 mm.; 2, 3·2 mm.; 3, 2·3 mm.; 4, 1·5 mm.; segment 1 with short, appressed, forwardly directed

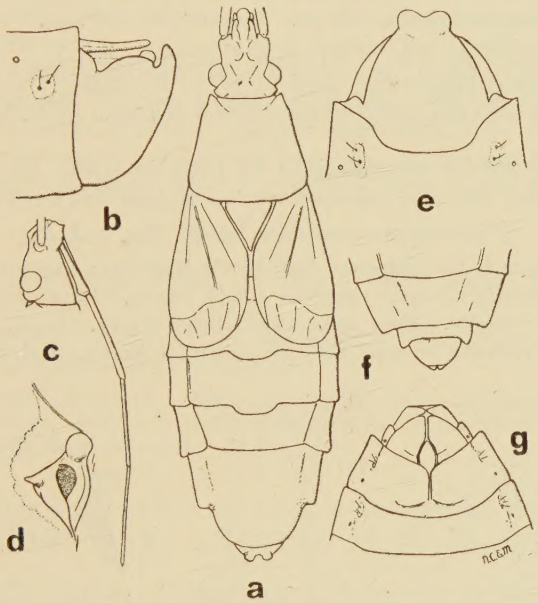


Fig. 1.—*Typhlocolpura chinai* sp. n. *b*, apex of abdomen from side, ♂; *c*, head from side; *d*, ostiole of metathoracic gland; *e*, apex of abdomen from below, ♂; *f*, apex of abdomen from above, ♀; *g*, apex of abdomen from below, ♀.

setae; segments 2 and 3 with very sparse, short, appressed setae, segment 3 having also moderately long, forwardly directed setae; segment 4 with dense, short, forwardly directed setae and sparse moderately long setae. *Surface of head* dorsally and laterally in front of eyes rugulose punctate; tylus in profile obtuse angulate, the angle rounded; vertex with two short arcuate sulci medially, sub-contiguous apically, and with two feeble arcuate sulci sub-dorsally with a deep fossa at basal end; upper area of genae behind eyes, tumescent; bucculae with a median short mucronate projection; rostrum reaching to about middle of 5th abdominal segment. Anterior lateral angles of *pronotum* acute with the angle rounded; anterior margin rounded; lateral margins almost straight; posterior margin sinuate; surface of disc irregularly, shallowly impressed, rugulose punctate in basal half. *Pleura* rugulose punctate; propleura with a deep narrow depression near

upper margin of anterior part of metazona; mesopleura with a deep irregular depression; metapleura with a circular depression near middle of upper margin. Ostiole of metathoracic gland, as figured. *Scutellum* about as broad as long, apex acute. *Hemielytra* with the corium thick and the membrane subcoriaceous, reaching about to posterior margin of 4th abdominal segment. *Abdomen* dorsally, granulose punctate, with irregular transverse sulci mid-dorsally on segments 4–7. Seventh segment of abdomen with the posterior margin produced and rounded, obscuring the 8th segment in the male; in the female, segment 8 is not obscured; abdomen ventrally with groups of 3 trichobothria sub-ventrally on segments 3 and 4, laterally on segments 5 and 6, and 2 trichobothria laterally on segment 7; abdomen mid-ventrally punctate; ventro-laterally rugulose punctate; trichobothria arranged in irregular sub-circular depressions; connexivum forming an obtuse angle with the dorsum of abdomen. *Femora* with short, sparse setae; tibiae with short sparse setae in basal half, long and moderately abundant setae in apical half, particularly on inner surface; tarsi with sparse sub-erect setae on upper, and moderately dense setae on lower surface; basal segment slightly longer than remaining segments together. *Head body* and *corium* with short recumbent setae arising from punctures.

Breadth across humeral angles, 3·0 mm. Total length, 12·0 mm.

Described from 3 ♂♂ (one of which is the type), and 1 ♀. F.M.S.: Perak, Tana Rata, Cameron Highlands, 18.iii.30 (*N. C. E. Miller*).

The type has been deposited in the British Museum (Nat. Hist.).

The following species was described by Breddin (1900, *Rev. Ent.*, **19** : 211), but it is considered that a supplementary description will be of use :

Microcolpura armillata Bredd. (fig. 2, *h–k*).

Colour. Segments 1–3 of antennae dark brown, glabrous; segment 3 with a narrow whitish-brown annulation basally; segment 4 light brown, with a narrow glabrous, dark brown annulation basally. Eyes red. Ocelli light brown. Head, pleura, abdomen ventrally black; rostrum brown. Disc of pronotum brown, darker in apical third;

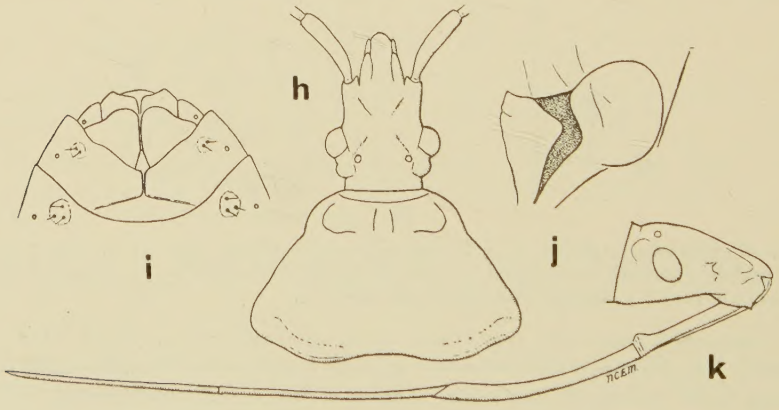


Fig. 2.—*Microcolpura armillata* Bredd. *h*, head and pronotum from above; *i*, apex of abdomen from below; *j*, ostiole of metathoracic gland; *k*, head from side.

scutellum dark brown with the apex ochreous. Corium vinaceous brown with an ochreous spot medially near apical margin. Membrane brown, basally black; wings hyaline, pale amber. Dorsum of abdomen castaneous; connexivum brown, with an indistinct ochreous spot in apical angle on segments 3–6 dorsally and ventrally. Legs light brown; anterior tibiae with basal, median and apical, somewhat suffused dark brown annulations; anterior

and median femora strongly suffused with dark brown; posterior femora suffused with dark brown apically. Setae fulvous, those covered with waxy substance appearing white. *Structure.* Segment 1 of antennae thicker than remaining segments, strongly constricted basally, and curving downwards feebly; segments 1–3 with low tubercles; segment 4 feebly tuberculate; all segments with short, forwardly directed setae; setae on segment 4 denser. Distance between ocelli about three times that between an ocellus and an eye. Tylus extending to about half the length of 1st antennal segment; horizontal in basal half, then descending; upper area of genae strongly tumescent; vertex with a diagonal sulcus from near base of antennal tubercles and from base of eyes to mid-vertex. Rostrum reaching to apical margin of 8th abdominal segment; 1st segment reaching almost to base of head; bucculae with a short mucronate spine. Disc of *pronotum* with a deep arcuate sulcus near anterior margin; with a crescentic sulcus sub-laterally and a median depression in apical third; basal third deflected and with an irregular depression laterally; humeral angles rounded; width across 3·5 mm.; posterior margin sinuate; lateral margins rounded in apical third then almost straight. *Scutellum* about as broad as long; surface finely granulose, with a smooth raised, ovate area apically. Propleura with a moderately deep arcuate sulcus in upper area of prozona. Anterior and median *femora* strongly spinose on each side of lower surface; lower surface of posterior femora tuberculate; tibiae with low tubercles and stout spines on inner surface apically. *Ostiole* of metathoracic glands and genitalia as figured. Surface of head, except base, pronotum, pleura, corium and ventral surface of abdomen punctate; laterally, ventral surface of abdomen feebly rugulose; trichobothria arranged in an irregular depression, the surface of which finely granulose; lateral margins of abdomen extend beyond the hemielytron from about the basal third.

Total length 11·0 mm.

Described * from 2 ♀♀. F.M.S.: Selangor, Bukit Kutu, 19.ix.30 (*N. C. E. Miller*).

I am greatly indebted to Mr. W. E. China of the British Museum for his assistance in the preparation of this paper.

* A number of ants (*Meranoplus mucronatus* Sm.) were associated with these Rhynchota at the time of capture. They were stroking the antennae of the "bugs" with the object, no doubt, of inducing them to secrete.

PROTOSTICTA FRASERI, A NEW SPECIES OF DRAGONFLY (PLATYSTICTINAE: ODONATA) FROM ASSAM, INDIA

By Clarence Hamilton Kennedy, F.R.E.S.

In a small shipment of purchased dragonflies collected by U. Nissor Singh, in Assam, India, during February and March, 1935, are three ♂♂ and one ♀ of a species of *Protosticta* larger than any so far described. It is with pleasure that I name this species after Colonel F. C. Fraser, I.M.S., the leading authority on oriental dragonflies.

Protosticta fraseri sp. n. (pl. 1, and fig. 1).

Description of holotype ♂. Abdomen, 60 mm. Hind-wing, 32 mm.

Head (pl. 1, fig. 1). Labrum ivory white (probably pale blue in life) narrowly edged below with jet black, the white of the labrum extending dorsad over the lower third of the vertical surface of the clypeus; remainder of clypeus dark, the dorsal surface being black. Base of mandible blue, light brown along lower edge and with a small intensely black spot on the extreme base, next gena. Gena at base of mandible brownish. Top of head black

except for a vaguely defined brownish area in front of middle ocellus and a similar area on outer side of each lateral ocellus, the second joint of the antenna pale and a light brown (or cream coloured) ray extending from each end of the occiput to the respective compound eye. These appear as cuneiform postobular spots. Labium and maxillae pale brown. Under surface of craneum with lower third next mouth-parts black, shading into a middle pale (cream coloured) third which shades into black on its upper or posterior edge. Eyes brown in the dried material. *Prothorax* (pl. 1, fig. 2). A pale blue wavy stripe along side. Below this the side black, above it brown with the various sulci pale brown and the prominences shading into black. Hind edge of posterior lobe with a wide notch which divides this area into a right and a left lobe, either of which is pale above and black on outer lower side. *Synthorax* (pl. 1, fig. 1). Uniformly black, except a faint greenish lustre on anterior surface (mesepisterna) and a vaguely defined lateral stripe extending from the metastigma along the anterior edge of the metepisternum to the alar carina. This stripe widens dorsad to cover the upper third of the metepisternum and shows traces of pale blue. Lateral angles of mesostigmal lamina pale. *Wings* in certain lights with the outer two-fifths very lightly clouded with bluish-white pruinosity. This area extends farther basad along the costal border where it reaches half-way from stigma to nodus than along anal border where it extends half as far, giving an oblique proximal edge to the clouded area. Stigmas black except that the membrane is narrowly edged with light brown visible when magnified.

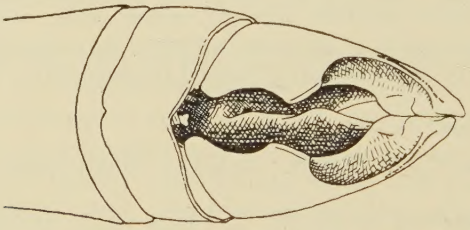


Fig. 1.—Dorsal view of ♂ abdominal appendages.

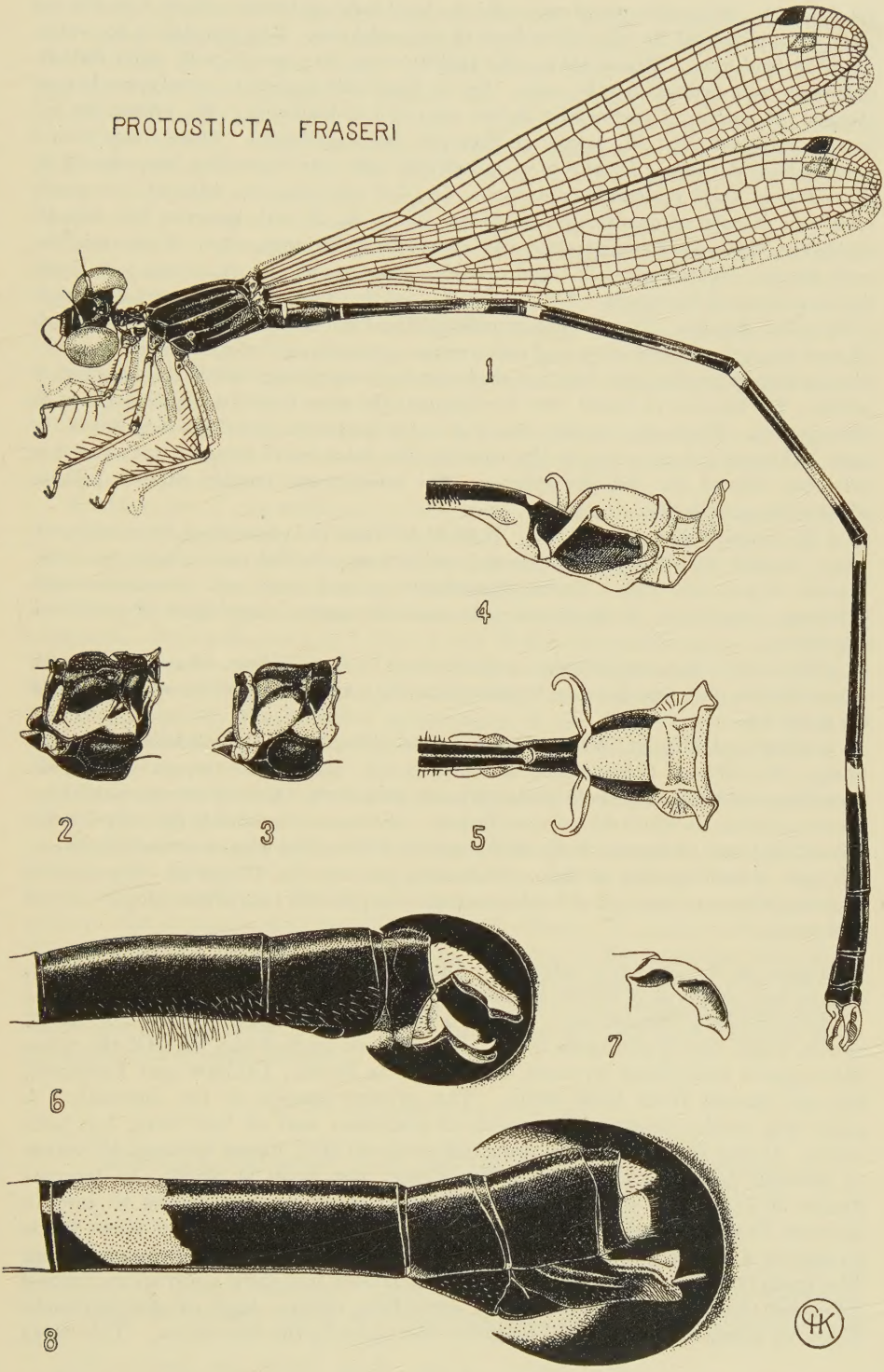
Legs pale, almost translucent, coxae slightly darker, spines black. Femur narrowly tipped with black and with a vague dark preapical band. A brown, hair-line, inner and also outer stripe on each tibia. Tibia and joints of tarsus tipped with dark brown.

Abdomen dark brown shading into black on segment and with segments 8–10 black. Appendages white. Segments 1–7 with pale areas as follows: seg. 1 with dorsal apical membrane pale; seg. 2 with narrow lanceolate blue stripe on anterior end of middorsal line. Sides clouded with paler brown. Seg. 3 with a bluish basal ring as wide as length of the apical structural ring of segment 2 and separated from base of segment by a distance equal to its width. A dimly defined pale brown, broad ring at base of apical third of segment. Segments 4–6 each with a basal ring three times as wide as that on segment 3, bluish-white in colour and each with a vaguely defined pale brown subapical ring of twice the width of the basal ring. Segment 7 with its basal fourth pale brown. *Structural characters*

Plate 1.

Protosticta fraseri sp. n.

Fig. 1. *Protosticta fraseri*, ♂ holotype, with head and body slightly rotated to show colour pattern. Approximately $2\frac{2}{3}$ times natural size; fig. 2. Prothorax of ♂; fig. 3. Prothorax of ♀; figs. 4 and 5. Penis. Fig. 5 is shown ventral side up; fig. 6. Segments 8–10 of ♂ abdomen; fig. 7. Right superior appendage of ♂ viewed obliquely from above, showing dorso-ental face; fig. 8. Segments 7–10 of ♀ abdomen.


PROTOSTICTA FRASERI
1
4
2
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8

(pl. 1, fig. 1). Wing with second antenodal at a level half-way between those of arculus and *Ac*. A supplemental *Ac* vein before level of antenodal one. 20 postnodals in fore-wing. 18–19 in hind-wing. Stigma subtending slightly more than one R_1 cell, wider distally, inner side more sloping than the outer. One to three cells doubled in costal space beyond stigma. M_2 arising at postnodal 8 in fore-wing at 7 in hind-wing. M_{1a} arising one cell beyond origin of M_2. M_3 arising at cross-vein below subnodus. Three wings with 2 postquadrangular cells. Right fore-wing with first cross-vein descending from base of M_3 at middle of third postquadrangular cell. Cu_1 7–8 cells long, Cu_2 reduced to a simple cross-vein at apex of quadrangle. *Prothorax* (pl. 1, fig. 2) with posterior lobe broadly divided in middle producing on either side a low lobe with sinuous edge. *Penis* (see desc. male No. 3). Not examined in holotype male. *Anal appendages* (pl. 1, figs. 1, 6, 7 and fig. 1) are shown in the figures. *The superiors* beyond the basal fourth turn down at an angle of forty-five degrees. They are hollow underneath at the base with the outer two-thirds of each concave on both inner and outer surface producing a " double hollow-ground " blade obliquely truncate and with its apical edge and ventral edge each slightly concave in profile. *The inferiors* in lateral view turn down at the same forty-five degree angle as do the superiors. This angle is so sharp that it gives the impression that they are broken at the base. They are $\frac{3}{4}$ to $\frac{4}{5}$ as long as the superiors, the outer fourth being an upturned claw extending beyond the club-like subapex. The inferiors are roughly parallel, perhaps slightly divergent in life.

♂ No. 2, abd. 61 mm., hwg. 35 mm. Postnodals 18 and 21 in fore-wings, 18 in each hind-wing. Labrum with black lower edge and with a dusky clouded area in each outer side. Vertical clypeus pale with a similar clouded area in each outer end. Postocular spots indistinct. Suggestion of an obscure paler band at base of outer third of abdominal segment 7.

♂ No. 3, abd. (incl. app.) 59 mm., hwg. 32 mm. Postnodals, fwgs. 19 and 20, hwgs. 18. *Penis* shown in pl. 1, figs. 4 and 5. Peculiar in having a low external fold across the base of the apical lobe.

♀, *allotype* (pl. 1, fig. 8). A teneral specimen but with colour fairly well developed. Abd. 43 mm., hwg. 30 mm. Colour similar to that of the ♂♂. Labrum and clypeus entirely pale. Area along middorsal carina pale (probably poorly preserved). Lateral thoracic pale stripe not recognisable, the whole side apparently dark. Abdomen coloured as in the ♂, even to the narrow basal band on segment 3, the black segments 8–10 and the white cerci and paraprocts. The apex of the ovipositor is white. *Postnodals*, fwg. 18, hwg. 17 and 16. M_2 arises at postnodal 8 in fore-wings and at 7 in hind-wings. Cu_2 six cells long in fore-wings, 5 cells in hind-wings.

Types in the author's collection, Ohio State University, Columbus, Ohio, except one paratype ♂ in the British Museum.

At first the ♀ puzzled me. Was it a ♀ of the same species as that of the ♂, one in which the ♂ abdomen is 40% longer than that of the ♀? Of the nineteen species recognised by such authorities as Fraser, Laidlaw and Lieftinck, ten are known from both sexes. The present species is the eleventh. A table was made showing the length of abdomen and of hind-wing for both sexes. It was found that this same difference of 40% exists between the sexes of *gravelyi* Laidlaw. In *antelopoides* Fraser the ratio is 32·5%, in *mortoni* Fraser 30·7%, from which it ranges through other smaller species to zero in *hearseyi* Fraser, one of the smallest. Apparently with greater size there tends to appear a greater difference between the sexes in the length of the abdomen. The table made showed that the wing-length does not show such an increasing difference between the sexes. One exception occurs, that of *simplicinervis* Selys, in which the abdominal length is the same in the two sexes. This rates

as a large species with the abdomen 42–45 mm. long. Curiously enough, in this exceptional species the hind-wing of the ♀, 25 mm., is *shorter* than that of the ♂ which is 29–30 mm. long. In nine of the other ten species the wings of the two sexes are subequal in length, but with increase in size of species the wing-length increases from 17·5–20 mm. in the small species, to 29–32 mm. in the larger species. One exception occurs; in *gravelyi* with a long abdomen, ♂ 46–49 mm., ♀ 33–35 mm., the hind-wing measurements are, ♂, 20–22 mm., the ♀, 19–23 mm., which gives a relatively short wing on a long species. This happens to the most abundant and widely distributed species known.

Ignoring the two exceptional species, *simplicinervis* and *gravelyi*, the above data suggest that with increase in size in *Protosticta* the wing mechanism is more conservative genetically than are weight and length of abdomen, which may not only increase in weight and length but may develop differences between the two sexes. Into this situation enters the factor limiting the length of the ♀ abdomen. This is that in a cylinder with increase in diameter weight increases more rapidly than with increase in length.

From the preceding considerations it is concluded that the great disparity in length between the two sexes described in this paper does not preclude their being one and the same species.

Further, the ♀ was collected by the same collector and in the same locality as were the ♂♂, presumably with the latter. As species of *Protosticta* are very local in distribution with no general occurrence on the streams where found, this is evidence that the ♀ belongs with the ♂♂.

The colour patterns except for some slight details on face and thorax are identical. In the figures (pl. 1, figs. 6 and 8) the white abdominal appendages in both sexes are emphasised. In the other eight large species (♂ abdomen 40 mm. or more) with described ♀♀, excepting *simplicinervis* Selys with inadequate description, the terminal appendages of the ♀ are given as black or "blackish brown." Apparently white is exceptional for ♀ appendages in *Protosticta*.

On the previous evidence of size, locality and colour pattern I do not doubt the identity of the ♀.

In Fraser's recent key (1933, *Fauna Brit. Ind., Odonata*, **1**: 102) to the eight Indian species of *Protosticta*, *fraseri* keys out to *uncata* Fraser, but this key is highly artificial. It is probably more closely related to *antelopoides* in spite of the fantastic anal appendages of the latter. *P. antelopoides* has great size (♂ abdomen 53 mm. long) and has the edge of the posterior lobe of the prothorax divided into two lobes which are more exaggerated than the two posterior lobes on the prothorax of *fraseri*. In the less complex ♂ anal appendages and the less development of the pair of prothoracic lobes *fraseri* is more generalised than *antelopoides*.

AFRICAN BEES OF THE GENUS *ANTHOPHORA* (HYM.)

By T. D. A. Cockerell, F.R.E.S.

All the species recorded below, and the holotypes of the new ones, will be found in the British Museum. The Ethiopian Region is at present known to have about 170 species and races of *Anthophora*. Palaearctic Africa has about 118.

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Anthophora acraënsis (Fabricius).

This is *A. acraënsis* as interpreted in 1933, *Rev. Zool. Bot. afr.*, **22**: 367. ♀♀.

Belgian Congo: Pawa, 1931 (*Dr. A. Dubois*). N. Rhodesia: Niankasa, Congo border, 12.x.1929 (*H. Silvester Evans*). The hair of thorax above is very bright red, with no admixture of black.

Anthophora aliceae Cockerell.

Cape Province: near Cango Caves, 1.xi. (*J. Ogilvie*); Nieuwoudtville, 18–22.xi. (*W. P. Cockerell*); Doorn River, 3.xi. (*W. P. Cockerell*); Bot River, 12.xi. 10 ♂♂ and 3 ♀♀ (*J. Ogilvie, L. Ogilvie*).

Variety. ♂♂ from Nieuwoudtville (*A. Mackie, L. Ogilvie*) with the light hair of thorax above, and of first tergite, strongly fulvescent. This approaches *A. angolensis* Dalla Torre, but is still easily distinguished by the pale wings and very much smaller size.

Anthophora arcana sp. n.

♀ (type). Length 13·5–14·5 mm., anterior wing about 10·6 mm.; clypeus black; labrum black, or with an obscure light mark; mandibles obscurely pallid basally; hair of head mainly black, but long and white on lower half of cheeks; short, thin and white on labrum; white at lower corners of face, and a narrow line up orbits to level of top of clypeus; antennae black, the flagellum very faintly brownish beneath; clypeus with a median keel; thorax above with dense bright orange-fulvous hair, extending also a short distance below wings, but sides of thorax otherwise with brownish-black hair; tegulae pale fulvous; wings dark fuliginous; all the legs with black hair; abdomen broad, black, almost bare, without light hair, except some white at extreme sides near apex.

♂. Length about 12 mm., anterior wing 10; face-markings light yellow, consisting of broad basal part of mandibles, labrum except the usual basal spots, broad-cuneiform lateral face-marks (the upper end at level of top of clypeus, with also a little projection up orbit), broad-triangular supraclypeal mark, clypeus (except a pair of boot-like marks with prominent heels and pointed toes), and broad mark on scape; flagellum dark red beneath; entire cheeks with long pure white hair; underside of thorax with white hair; front legs with white hair, the others with black; margins of tergites brownish; fourth tergite without white hair, except a few hairs at extreme sides; fifth and sixth thinly clothed with white hair, especially at sides; apical teeth widely separated, black and strong. In Friese's table this runs nearest to *A. acraënsis* (Fabricius); in my table (1933) next to *A. luluana* Cockerell, which has quite different face-marks.

Uganda: type ♀ from Mbale–Kumi Road, 3,700 ft., S. of Lake Salisbury, 15–17.viii.1911 (*S. A. Neave*). Other ♀♀ from N.W. Shore of Victoria Nyanza, 3,800–3,900 ft., ix.1911 (*Neave*); Entebbe, 1909 (*C. C. Gowdey*). ♂ from Siroko River, near west foot of Mt. Elgon, 3,600 ft., 12–14.viii.1911 (*Neave*).

Conspicuously smaller than *A. flavicollis* Gerstaecker, and with the black clypeus of *A. nigroclypeata* Friese. It has few distinctive characters, but I think it is a valid species.

Anthophora armata Friese.

Cape Province: Mafeking, 27.ii., 1 and 2.iii., ♂♂ (*J. Ogilvie, L. Ogilvie*). Bechuanaland: Palapye Road, 6.iii., ♂ (*J. Ogilvie*).

The hind basitarsi have an immense tooth anteriorly on the basal half; the clypeus is light yellow, with a very small black spot at each side.

Anthophora atribasis Cockerell.

Gold Coast: Yapi, xi.1916, one ♀ (*J. J. Simpson*). This was described from the ♂ (N. Nigeria); the ♀ is very similar; the clypeus has a large reversed yellow T, the scape is not yellow in front, and there are no lateral face-marks; the hair of the hind legs is entirely black, and the middle tibiae on outer side have less than the basal half light-haired; margin of fifth tergite densely clothed with black hair.

Anthophora basalis Smith.

Cape Province: Belmont, 22.ii., both sexes (*L. Ogilvie, J. Ogilvie*). Orange Free State: Donkerpoort, 18.iv. (*J. Ogilvie*). ♂, the hair paler and more fulvous than usual.

A noteworthy character of this species is the broad hind basitarsus of the ♂. The black of upper part of clypeus in the ♂ may be continuous right across, or may (Belmont) be interrupted by a narrow white band.

Anthophora caerulea Friese.

British E. Africa (Kenya): Kibwezi, 3,000 ft., 2–4.iv.1911, three ♂♂ (*S. A. Neave*); Kitui (*S. W. J. Scholefield*). I am not at present able to separate these ♂♂ from *A. caerulea*. The rather dull blue of the abdomen is not greenish, and the lower edge of the black patch on each side of clypeus is emarginate, producing the outline of a boot with a heel, whereas in *A. caelestina* Cockerell it is straight.

Anthophora caelestina Cockerell.

Cape Province: Port St. John, Pondoland, ♂♂ in March, ♀♀ in April (*R. E. Turner*). Transvaal: "Warmb., 10.10.03, 4817," from the Cameron collection, is presumably from Warmbaths. Uganda: S.E. Ankole, 4,400–4,800 ft., 4–8.x.1911 (*S. A. Neave*). Compared with S. African specimens, this ♀ has the abdomen somewhat greener, but it cannot be separated.

Anthophora circulata (Fabricius).

Belgian Congo: Sakania, ♀ (*J. Ogilvie*). This specimen seems to belong to *A. circulata*, but a ♀ from the same place is better referred to *A. ogilviae* Ckll.

Anthophora diloloensis Cockerell.

Belgian Congo (Katanga): ♂♂ from Dilolo and Tenke differ from *A. ogilviei* Ckll. not only in the narrow median band of clypeus, but also in the hind basitarsi being black, with only a small white tuft at base, and the fifth tergite with white hair only at sides, instead of a continuous white band. The flagellum has a conspicuous red spot near the base. However, two ♂♂ from the Kafubu Mission, Katanga (*J. Ogilvie, L. Ogilvie*) differ, one having the red spot on flagellum absent, and both having a fairly developed white band on fifth tergite. It seems probable that the white band was abraded in the others. As the face-marks of *A. ogilviei* are variable (a second specimen from Zimbabwe having the median band of clypeus only about half as broad), it seems impracticable to recognise two species.

Anthophora diloloensis ogilviei (Cockerell).

♂♂ were collected in S. Rhodesia: Zimbabwe (*J. Ogilvie*, *A. Mackie*); in Katanga: Sakania (*J. Ogilvie*), form with flagellum all black; and in Natal: Amanzimtoti (*A. Mackie*) and the Bluff, Durban (*Cockerell*). Compared with the S. African species treated as *A. fallax* Smith, they seem more robust, the flagellum typically (but not invariably) has the red spot near base, and the hind basitarsi have about the basal half covered with pale hair, the apical half black, contrasting.

♀♀ are from Zimbabwe (*A. Mackie*), Amanzimtoti (*W. P. Cockerell*), Wonderboom near Pretoria (*J. Ogilvie*). There is also one from Oudtshoorn, C.P. (*J. Ogilvie*) which seems inseparable. A series of six ♀♀ from Greytown, Natal (*W. P. Cockerell*, *A. Mackie*, *J. Ogilvie*, *L. Ogilvie*) must be referred here, but the hind tibiae have the hair on outer side varying from strongly reddened anteriorly to practically all white. These must belong with the Greytown ♂♂ recorded under *A. fallax*.

Orange Free State: Bosrand, Afdeling Farm, 30.iii. (*J. Ogilvie*). ♂♂.

Anthophora epichariformis Gribodo.

Cape Province: Matjesfontein, 19–21.xii.1928, three ♀♀ (*R. E. Turner*). The type locality is Rondebosch, which has a rainfall of 66·5 inches, whereas Matjesfontein is excessively dry. The specimens, however, agree sufficiently with Gribodo's description. A specially noteworthy feature is the biundulate grey band on third tergite. The clypeus and labrum are entirely black.

Anthophora fallax Smith.

♂♂ assigned here, following current usage (but probably different from the Sierra Leone type) are very like *A. ogilviei*, but the hind basitarsi are clothed externally with pale hair, the flagellum is black (a small red spot in one from Doorn River Falls), and the abdomen has five well-developed white hair-bands.

Natal: Greytown (*J. Ogilvie*, *A. Mackie*), intermediate, in respect to the hind basitarsi, between *A. fallax* and *A. ogilviei*. Orange Free State: Ficksburg (*J. Ogilvie*). Cape Province: Doorn River Falls (*A. Mackie*, *J. Ogilvie*); Huguenot (*J. Ogilvie*, *A. Mackie*); Graaf Reinet (*J. Ogilvie*); Van Rhyn's Pass (*L. Ogilvie*); Mafeking (*Ogilvie*). ♂♂ from Mafeking have the hind basitarsi with the hair on inner side black or nearly so, on outer side thin and pale, except in two, which have only the basal half pale haired externally (as in *A. ogilviei*); the antennae are black.

Anthophora flavicollis Gerstaecker.

Uganda: Entebbe (*C. C. Gowdey*); Lake Rudolf, mouth of Kabua River (*E. B. Worthington*). Cape Province: Mafeking, 27.ii., ♂ (*J. Ogilvie*). Bechuanaland: Lobatsi, 16.iii., ♂ (*L. Ogilvie*).

These southern ♂♂ have white hair on the sixth tergite, and some on the fifth, but none on the fourth. According to Friese, *A. flavicollis* ♂ should have the hair on all tergites black. I think now that the S. African ♂♂ cannot well be separated specifically from what I have regarded as *A. aethiopica* Cameron, though that species has the apical portion of tergite 4 typically light haired. Cameron's description is so ambiguous that I am not sure I correctly identified his species. (1933, *Stylops*, **2**: 134; 1933, *Rev. Zool. Bot. afr.*, **22**: 367, 369.)

Comparing a ♂, supposed to be *A. aethiopica*, with a ♂ *A. flavicollis* from

Kisantu, Belgian Congo, I note that the former (from Mafeking) has the fifth tergite covered with white hair, but in the latter there is white hair only on the apical half of the tergite, and black on the basal part. One ♂ from Mafeking has a little white hair on apical part of fourth tergite. If *A. aethiopica*, as I have understood it, is correctly determined, I now think it can take only subspecific rank at best.

Anthophora grisella Cockerell.

Cape Province: Calvinia, ♀♀ (*J. Ogilvie, W. P. Cockerell, A. Mackie*); Nieuwoudtville, ♀ (*W. P. Cockerell*); Blaukrans, ♂ (*L. Ogilvie*); Van Rhyn's Pass, ♂♂ (*J. Ogilvie, L. Ogilvie*).

Anthophora leucospila sp. n.

♂. Length about 14–17 mm., anterior wing 10–13 mm.; black, very robust, with large eyes and a rather narrow face; face markings white, as follows, an oblong mark on base of mandibles, mark on clypeus like an inverted champagne glass, the narrow stem reaching upper margin, touching a slender line on lower margin of supraclypeal area, the broad portion of the clypeal mark extending to sides below, but there is a black line on the actual margin, long-cuneiform lateral face-marks (the upper end concave) and a white stripe on scape; flagellum dark reddish beneath; third antennal joint very long, fourth very short; hair of head all black, but the clypeus is exposed; mesothorax with short dark brown to black hair, and mesopleura with the same, shading to mouse-grey on hind part of thorax, but the scutellum and upper part of thorax posteriorly are densely covered with fulvous to bright ferruginous hair, which extends forward under the wings, and also covers the first tergite, varying thereon to whitish posteriorly; tegulae black; wings with about the basal half hyaline and the apical half brown, nervures very dark brown; legs black, the front pair with black hair, the middle and hind tibiae with clear white hair on outer side, black on inner; middle tarsi with a little pale hair, hind tarsi with more, covering outer side of basitarsi, but a red bristle at end of basitarsus, and two at end of second joint; middle tarsi with no apical brush; second tergite black and bare, except a rather broad band of appressed greyish-fulvescent hair on margin; tergites 2 to 4 with similar bands, increasingly broad; venter with long white hair; apex of abdomen with a median angular projection, and on each side a very small spine.

Cape Province: Matjesfontein, 1–18.xii.1928, 11 ♂♂ (*R. E. Turner*), British Museum. A remarkable species, the abdomen resembling that of *A. gigantea* Friese, but the head and mesothorax with dark hair.

Anthophora megasoma Cockerell.

Bechuanaland: Palapye Road, 6.iii.1934, ♀ (*J. Ogilvie*).

Anthophora nigroclypeata Friese.

Gold Coast: Brit. Nyive, ♀, Brit. Museum.

Anthophora nigromixta sp. n.

♀. Length about 16 mm., anterior wing 10·5 (the wings unusually short); very robust, black, including labrum, mandibles, antennae and legs, but tegulae dark reddish; labrum rugose; clypeus with a median creamy-white band, not quite reaching upper margin, but expanding below; supraclypeal mark a small high triangle; hair of labrum slightly reddish,

of face and front thin and blackish, with some white, especially at sides; occiput with black hair, but some pale hair on vertex; cheeks with abundant clear white hair; mesothorax glistening, minutely lineolate; thorax above with dark brown hair, mixed with pale, posteriorly it is dull whitish, but a large tuft of dark brown hair behind wings; sides of thorax with very dark brown hair; wings dilute brown, basal nervure falling conspicuously short of nervulus; legs with black hair, front trochanters beneath with pale, and front tarsi with dark red hair on inner side; spurs dark red; first tergite with sooty hair, a little paler at sides; second and third tergites with only very thin black hair; fourth with thin pale grey hair, mixed with black; fifth the same, but with long white hair at sides; apex with black.

Kenya: S.E. slopes of Mt. Kenya, 6,000–7,000 ft., 3–12.ii.1911 (*S. A. Neave*). Related to *A. nubica* Lepeletier, but much more melanic. The pale hair of metathorax distinguishes it from the forms named *ugandae* Meade-Waldo, *tellervo* Strand and *congoënsis* Friese.

Anthophora niveata Friese.

Orange Free State: Ficksburg, ii.–iii. (*A. Mackie*). S.W. Africa: Aus, xii. (*Turner*); Windhoek (*J. Ogilvie*); Omaruru (*L. Ogilvie, J. Ogilvie*). Cape Province: Matjesfontein, xii. (*Turner*); Nieuwoudtville (*W. P. Cockerell, J. Ogilvie*); Milnerton, Cape Town, xii. (*Turner*); Upington (*J. Ogilvie*); Belmont (*L. Ogilvie*); Beaufort West (*L. Ogilvie, J. Ogilvie*); Nelspoort (*J. Ogilvie*); Worcester (*Turner*); Doorn River Falls, xi. (*L. Ogilvie*).

Variety *amphigynops* Cockerell. Windhoek, 14.xii.1933, one ♂ (*J. Ogilvie*).

Anthophora nivescens sp. n.

♂. Length about 11 mm., anterior wing 8·8; black, including legs, but the high clypeus (except a variable elongate black mark along each side), band-like supraclypeal mark with a small angular extension above in middle, the large labrum (except the usual spots at basal corners), mandibles externally except at apex, and elongate mark on scape, bright lemon yellow; eyes reddish; pubescence white, on dorsum of thorax pure white with no admixture of black; abdomen covered with appressed white hair, except narrow basal margin of second tergite, the hair denser and therefore appearing whiter on margins of tergites, giving the effect of white bands on a grey background; tegulae light red; wings milky hyaline, nervures dark; legs simple, middle tarsi with no black brush; hind basitarsi white haired on outer side, black on inner, as also are the hind tibiae. Near to *A. niveata* Friese, but easily distinguished by the hair covering abdomen, the white hair on outer side of hind basitarsi, the shorter third antennal joint, and the larger labrum. The blade of maxilla is very long, red, with the base broadly black. Spurs black; apex of abdomen bidentate, with no projection between the teeth.

S.W. Africa: Swakopmund, 6.ii.1934, 30 ♂♂ (*J. Ogilvie, L. Ogilvie*); also a ♂ collected at the same place (*R. E. Turner*), 2–4.iv.1928.

Anthophora nubica Lepeletier.

The ♂♂ differ from Lepeletier's description in having the antennae entirely black.

S.W. Africa: Windhoek (*J. Ogilvie, L. Ogilvie*); Aus (*Turner*); Gobabis, 17.xii. (*L. Ogilvie*); Keetmanshop, 6.xi. (*Turner*). Cape Province: Belmont, 27.ii. (*J. Ogilvie*). Bechuanaland: Lobatsi, 16.iii. (*J. Ogilvie*); Palapye Road, 4.iii. (*J. Ogilvie*).

Anthophora plumipes (Fabricius).

Belgian Congo: Kansenia, Katanga (*G. F. de Witte*); Kisantu (*R. P. Vanderyst*); Kabwe, Lomami (*P. Quarré*). N. Rhodesia: N'Changa (*C. T. Macnamara*). Nyasaland: (*S. K. Norris*). Orange Free State: Bosrand, Afdeling Farm (*J. Ogilvie*). Cape Province: Worcester (*R. E. Turner*); Upington (*J. Ogilvie*).

Anthophora rubricans Cockerell.

Cape Province: ♀♀ from Calvinia (*J. Ogilvie*), Doorn River Falls (*J. Ogilvie*); Ceres (*J. Ogilvie*); Huguenot (*L. Ogilvie*); Bot River, 6; 7–11.xi. (*J. Ogilvie, L. Ogilvie*); Beaufort West, 3 (*Ogilvie*); Swellendam, xi.1933, 3 (*R. E. Turner*).

Anthophora rubricans aspilostoma subsp. n.

♀. Like *A. rubricans* Cockerell, but no black hair below wings, and no black streak below knee on hind tibia. The tegulae are red, and the spurs are black or practically so. (Cameron says *A. spilostoma* has piceous tegulae and dark testaceous spurs.) Antennae entirely black; supraclypeal mark broadly triangular; hair on outer side of hind tibiae pale red, becoming white posteriorly, that on inner side of hind basitarsi bright red, but the large apical brush black. The broad abdominal hair-bands are greyish-white, varying to pale fulvescent.

Orange Free State: Donkerpoort: 12 ♀♀, 18.iv.1934 (*J. Ogilvie, L. Ogilvie*). This is the insect recorded as *A. spilostoma* in 1932, *Amer. Mus. Nov.* **547**: 16. As it is constant in a series, and I cannot reconcile it with Cameron's description, I give it a new name. There are also 4 ♀♀ from Belmont, C.P., 23–24.ii. (*J. Ogilvie*). 2 from Lobatsi, Bechuanaland (*Ogilvie*), belong here, but there is a short brown stripe from the hind knee.

Anthophora rufolanata Dours.

Cape Province: Oudtshoorn, x.xi. (*J. Ogilvie*); Doorn River, 3.xi. (*W. P. Cockerell*). These are ♀♀; the fifth tergite is covered with black hair, except at extreme sides. 4 ♀♀ from Kirstenbosch, 18.xi.1933 (*Ogilvie*).

Anthophora terminata Smith.

Natal: Weenen, i.1926 (*Thomasset*). Bechuanaland: Palapye Road, 6.iii. (*J. Ogilvie*). This is a ♀, not described by Smith. It is easily distinguished from ♀ *A. nubica* Lepeletier by the pale yellow face-marks, labrum pale yellow with two black spots at base, and fourth tergite white right across at base. It is also distinctly smaller.

The British Museum has ♀ *A. terminata* from Nyasaland, and also one collected by H. Silvester Evans in N. Rhodesia, near Kipushi, on the Congo border, 20.iii.1928.

Anthophora vestita Smith.

Orange Free State: Bosrand, Afdeling Farm (*J. Ogilvie, L. Ogilvie*); North Bank Halt, Norvals Pont (*J. Ogilvie*); Donkerpoort (*J. Ogilvie*); Ficksburg (*J. Ogilvie*); Harrismith (*Turner*). Cape Province: Beaufort West (*J. Ogilvie*); Bot River (*J. Ogilvie*); near George (*J. Ogilvie*), a variation with the apical band of clypeus having a pointed upward extension in middle. This extension is longer, reaching more than half-way up clypeus, in a ♀ from Somerset East (*Turner*). Aliwal North (*Turner*); Queenstown, 3,500 ft. (*Turner*). Zululand: Eshowe, iii. (*Turner*).

Variety. ♀ with entirely black clypeus, but yellow spot on mandibles remaining. Nieuwoudtville (*J. Ogilvie*); and Ficksburg (*J. Ogilvie*), the latter with a minute yellow dot in middle of marginal area. Also, a ♀ from Nieuwoudtville has an interrupted yellow marginal band on clypeus. Although the form with the black clypeus is less frequent than the other, it is the nomenclatural type. The ♂ has the clypeus yellow, with a dark mark on each side of upper part.

Variety *greyae* (Cockerell). 1 ♀ and 3 ♂♂ from Donkerpoort, O.F.S. (*J. Ogilvie, L. Ogilvie*). One ♂ has the black marks on upper part of clypeus enlarged, and emarginate below; in the other two the marks are minute. In all these ♂♂ the supraclypeal mark is a narrow transverse band, not pointed above, and the spurs are light red. The ♀ from Donkerpoort is not typical of *greyae*, as it has the hair of abdomen distinctly fulvescent, and the clypeus has an entire marginal yellow band. In a ♀ topotype, from Lady Grey, 4.ii.1925 (*R. J. Nel*) the hair of abdomen is pale grey, black on fifth tergite except at extreme sides, and the clypeus is black, with a yellow spot at each lower corner.

Anthophora zinniae Cockerell.

The ♂ has the clypeus yellow, with a small black marginal stripe on upper half at each side. (The ♂ *A. torrida* Sm. has large black marks on clypeus.)

Cape Province: Mafeking, both sexes (*Ogilvie*); Upington, ♀ (*L. Ogilvie*). Bechuanaland: Palapye Road, both sexes (*Ogilvie*); Lobatsi, both sexes (*Ogilvie*). S.W. Africa: Windhoek, both sexes (*Ogilvie*); Otavi, ♀♀ (*L. Ogilvie*). Natal: Weenen, ♀♀ (*Thomasset*); Amanzimtoti, ♀ (*W. P. Cockerell*); Durban (*J. Ogilvie*). S. Rhodesia: Victoria Falls, ♀ (*J. Ogilvie*).

A NEW BEE OF THE GENUS *CTENOPLECTRA* SM. (HYMENOPTERA, APOIDEA)

By V. B. Popov.

(*Leningrad.*)

Communicated by Dr. S. A. Neave, F.R.E.S.

Ctenoplectra ussuriana sp. n.

♂. Length 10·5 mm. *Head* (fig. 1) distinctly narrower than the thorax, flat, nearly as long as broad. Clypeus irregularly trapezoidal, distinctly broader than long, nearly flat. Supraclypeal area nearly quadrate. Upper lip very short, more than twice broader than long, rather convex. Mandibles short, bidentate. Maxillary palpi 5-jointed, labial palpi 4-jointed. Antennae rather long, reaching beyond the middle of mesonotum, 13-jointed. Scapus rather long and thin; 2nd joint of flagellum nearly one-third longer than its greatest width at the apex; 3rd joint nearly one-third broader than long; all following ones distinctly longer than broad. Face with distinctly prominent short medial keel. Scutellum rather flat, broadly rounded, more than twice broader than long. Femora and tibiae of the 1st and 2nd pairs of legs slightly, those of the 3rd pair strongly swollen (fig. 2). Metatarsus parallel-sided, slightly rounded at angles, more than four times longer than broad. Abdomen distinctly convex, narrow, strongly curved. Apical portions of tergites 2–6 distinctly rising. Tergite 7 broad, with small and flat median tooth (pygidium). Second sternite with slight and a small median projection basally and with a rather deep and narrow transversal furrow, nearly equal to one-half of the width of the sternite. Fifth sternite broadly emarginated apically, with two lateral teeth. Sixth

sternite (fig. 3) large, with large basal lobes, rounded sides and broad and straight apex, the latter distinctly prolongated laterally, prominent ventrally and densely covered with rather short hairs. Seventh sternite (fig. 4) with basal lobes, apex deeply emarginated and double lateral lobes lying in the dorso-ventral direction. Eighth sternite (fig. 5) rather narrow prolonged basally, with rather small lateral lobes and very large flat triangular apex, densely covered with long hairs (fig. 6). Genitalia (figs. 7 and 8) not much flattened dorso-ventrally. Basal ring very short, its greatest length being nearly equal to one-quarter of the length of stipes. Stipites long, dorsally more than twice longer than broad, rounded on their base and apical angles distinctly narrowed towards the prominent apex. Squamae simple, equal to two-thirds of the length of stipites, narrow and flat, distinctly narrowed towards their acute apex and covered with rather short and rare hairs. Volsellae prominent, convex ventrally, with small teeth on their inner sides.

FIGS. 1–8.—*C. ussuriana* sp. n, ♂. 1, Head; 2, third left leg; 3, sixth sternite; 4, seventh sternite (with right lateral lobe unbent); 5, eighth sternite; 6, lateral view of eighth sternite; 7, dorsal view of the male genitalia; 8, do. lateral view.

Sagittae slightly curved, with broad base, deeply emarginated medially on their inner sides and with long and acute S-like curved apex, covered dorsally with a row of rather long hairs. *Black.* Upper lip, base of mandibles and malar spaces, clypeus, supraclypeal area, lateral portions of the face and base of tibiae of the 1st and 2nd pairs of legs yellow. Exterior part of the antennal scape and flagellum, except the uppersides of fore six joints, yellowish-red. Exterior sides of the second and third tibiae yellowish-brown. Tegulae, tarsi, apical bands on the tergites and a narrow band on the sternites yellowish-red. Wings dilute-brownish; venation dark brown; stigma reddish-brown. *Clypeus*, supraclypeal area and lateral portions of the face covered with rather small and indistinct punctures; the distance separating them being equal from one-half to one and one-half times their diameters. Face covered with coarser obliquely placed punctures, with intervals between them equalling from one-half to twice their diameters. Vertex and tempora with slight and irregular punctures. Mesonotum covered with small and regular

punctures, distance between them equalling one-quarter to one-half of their diameters; disc covered distinctly more scarcely, the distance between the punctures equalling two to three times their diameters. Punctures on the scutellum slightly coarser and more dense. Sternum and pleura of the thorax covered with slight and oblique punctures, the intervals being distinctly broader than their diameters. Median area of the propodeum bare, unpunctured, rather shining. Other parts of the median segment covered with very scarce and slight punctures. Abdominal tergites strongly shining, covered with very slight and scarce punctures, the distance between them equalling five to six times their diameters. Vertical part of the 1st tergite distinctly scope, unpunctured. Apical parts of the tergites unpunctured. Sternites densely and regularly shagreened. Femora and tibiae of all legs covered with rather slight and partially, on second tibiae, very dense punctures. *Head,* thorax and legs covered with rather dense and short yellowish-white hairs. Hairs on the vertex, pleura of the thorax and femora distinctly longer. Hairs on the external parts of the third tibiae and metatarsi very dense, long and distinctly brighter. Abdomen covered with scarce and short pale hairs. Preapical ciliae on the tergites scarce and rather long. Apical bands of the third to fifth sternites covered with long pale hairs.

Russian Far East: Krivoj Kljutsh, near Nikolsk-Ussurijsk, Maritime Province, 30.vii.1933 (*T. P. Samojlov*), 1 ♂.

Type in the collection of the Zoological Institute, Academy of Sciences, Leningrad.

In the character of the eighth sternite this new species is very similar to *C. apicalis* Sm. (Burma) and *C. kellogi* Ckll. (China), but easily distinguishable by its smaller dimensions and black abdomen, metallic blue in both named forms. *C. davidi* Vach., the nearest neighbour geographically ("Mou-Pin, région de Pékin") to *C. ussuriana* was established on a single female. Its very short description is as follows: "Nigra, nigro-pilosa, capite et segmento 6 squalido fulvido pilosis; alis squalido-hyalinis, nervis nigris. Long 9–10 mm." *C. ussuriana* sp. n. obviously differs from it by its pale hairs and reddish-brown tarsi.

The geographical distribution of the genus *Ctenoplectra* is of great interest. There are recorded only 30 species of the genus: 21 of them, in 23 forms, occurring in the Aethiopian region, from Liberia, Abyssinia and Somali to the South African Union (Natal), 3 species inhabiting Burma, Malay Peninsula and, partially Celebes and New Guinea (*C. chalybaea* Sm. 1857, *C. apicalis* Sm. 1879 and *C. cornuta* Grib 1891), 2 species are found in China (*C. davidi* Vach. 1903 and *C. kellogi* Ckll. 1930), 2 in Formosa (*C. tuberculiceps* Strand and *C. simpliciceps* Strand), 1 species is described from the Philippine Islands (*C. vagans* Ckll. 1904) and 1 from North Queensland, Australia (*C. australica* Ckll. 1926). Thus, *C. ussuriana* sp. n. appears to be the most northern member in this series, belonging to a group of species inhabiting the western coast of the Pacific and going as far north as to the Palaearctic region. If Prof. T. D. A. Cockerell (1933, *Rev. zool. bot. afric.*, **23**: 276) is right in believing that the genus *Ctenoplectra* is very ancient, *C. ussuriana* proves to be a relic element in the fauna of the Ussuri region, like many others among insects of this fauna. It is noteworthy that among species of this group of *Ctenoplectra* (*C. apicalis* Sm. and *C. kellogi* Ckll.), with metallic blue abdomen, only *C. ussuriana* has a black abdomen.

The description and figures of the male genitalia of *C. ussuriana* are the first known at present in the genus. There are many characters separating it from *Macropis* Pz. The figures of the male genitalia of *M. labiata* Pz. are given by E. Saunders (1882, *Trans. ent. Soc. Lond.*, **1882**: pl. X., fig. 1–1*c*).

MICROGASTERINAE: NOTES AND NEW SPECIES (HYM. BRAC.)

By D. S. Wilkinson, F.R.E.S.

(*Imperial Institute of Entomology.*)

Apanteles seyrigi sp. n.

♀. Black; mouth-parts to a great extent, fore legs entirely (including the coxae but excepting the feet), middle and hind legs entirely (including the coxae but excepting the tibial spurs which are pale, the middle tarsi which are somewhat darkened, and the feet and hind tarsi which are throughout strongly darkened), red testaceous; tegulae testaceous; wings hyaline, the setae of the fore-wings coloured, of the hind-wings white; costal veins basally testaceous, as are all veins in at least the basal half of the wing; the pseudostigma, and the margins of the stigma, brown; radial, transverse cubital, 2nd cubital, apical portion of 1st cubital, recurrent, and one or two others, pale brown; metacarp more or less testaceous to pale brown; stigma more or less hyaline discally.

♂. Black; mouth-parts to a great extent, the femora, tibiae, and tibial spurs of the front legs, the femora and tibiae of the four posterior legs, red testaceous; all trochanters and trochantines, tarsi of the four anterior legs, and extreme apex of hind tibiae, throughout darkened; feet, and hind tarsi throughout, strongly darkened; tibial spurs of the four posterior legs pale; tegulae testaceous; wings hyaline, the setae white; some apical portions of the costal veins, the margins of the stigma, the pseudostigma, and metacarp, weakly coloured, the remaining veins virtually colourless; stigma discally hyaline.

♀♂. *Head*: clypeus, face, frontal orbits, frons, and vertex, throughout regularly, rather closely punctate (degree 3); facial depressions nearer to apex of clypeus than to the eyes; posterior ocelli rather nearer to each other than to the eyes; flagellum of ♂ equal to the combined length of head, thorax, and abdomen, of ♀ shorter, about equal to the combined length of the head and thorax together with the four basal tergites. *Thorax*: mesonotum throughout with well marked (degree 3 or 3–4), more or less regular punctation, anteriorly the punctures rather stronger and rather more closely placed than those in the posterior areas; mesonotum otherwise smooth, and the lines of the notauli indicated only by those areas being slightly depressed, with the punctures perhaps rather closer, and the setae lying at a different angle; scutellar sulcus evenly rounded, apparently not crenulate; disc of scutellum punctate (degree 3), the punctures widely separated down the middle but increasingly closely placed as the lateral margins are approached; propodeon in basal half with a small, entirely smooth, shining area in the middle, otherwise punctate (degrees 3 and 4) and more or less dull since the punctures are not very clean, in apical half with the medial fifth occupied by a very strongly marked ⌣-shaped area (the lateral sides of which are made up of a bunch of carinae), and the lateral two-fifths more or less smooth in the smaller specimens (♂♂) but with much sometimes quite strong striation and/or carination in the larger specimens (♀♀). *Wings*: the length of the recurrent and of the apical portion of the 1st abscissa of the cubital, and the breadth of the stigma, all about equal, twice the length of the pigmented portion of the 2nd abscissa of the cubital (which is equal to the upper portion of the basal vein), about 1·3 times the length of the transverse cubital (20 : 15), and two-thirds the length of the 1st abscissa of the radial; the 1st abscissa of the radial slightly rounded, the transverse cubital straight, and their point of junction virtually indeterminable; stigma considerably shorter than metacarp. *Legs*: hind coxae punctate (degree 3), the punctures on the outer faces more widely placed than those basally above; in the ♀ the tibial spurs rather variable, the longer spur more usually about four-ninths (but occasionally only two-fifths), and the shorter spur more usually about two-sevenths, in the ♂ apparently more regular, the longer spur just less than half, and the shorter spur about two-

sevenths, the length of the basal joint of the hind tarsus. *Abdomen* (fig. 1): 1st tergite excavated in the basal half, strongly turned over in the apical half, the whole very highly polished and entirely smooth save for some sculpture round the median insertion and for a few strong punctures on the sides just beyond the middle; 2nd tergite very highly polished and entirely smooth save for a row of three or four punctures on each side across just before

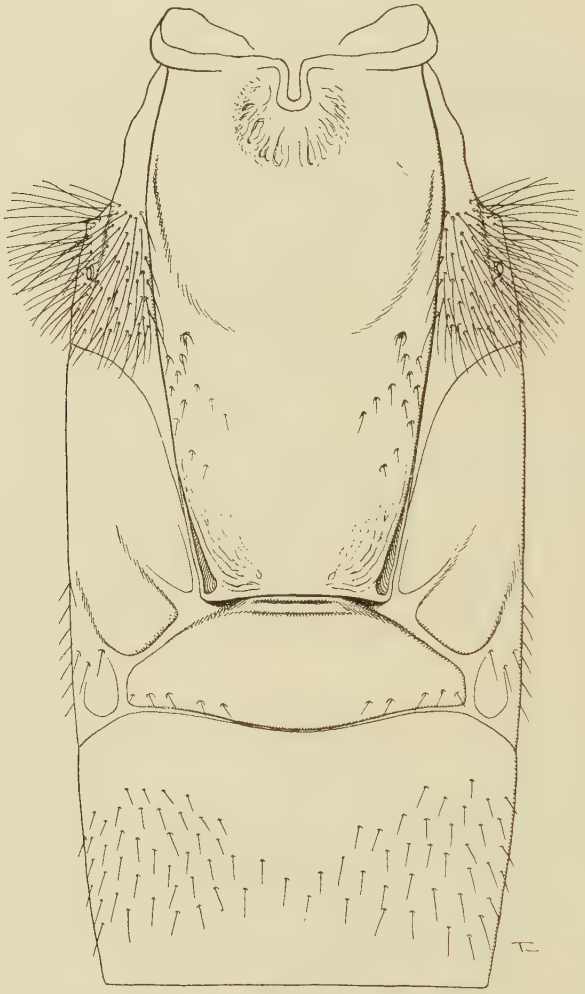

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Fig. 1.—*Apanteles seyrigi* sp. n.; the three basal tergites, female.

apex; 3rd tergite smooth and polished, with some six rows of minute (degree 1) punctures so arranged as to leave the tergite entirely smooth very broadly across apex, in a large median basal triangular area, and in the basal angles; succeeding tergites smooth with minute punctation; hypopygium of ♀ acute, more or less membranously so, and apparently * with

* Without dissection, and I have not enough material for this, it is impossible to state categorically that there is a median longitudinal suture, although from my knowledge of other, related species I am convinced that there is.

a median longitudinal suture; ovipositor sheaths about equal to or just a little shorter than the combined length of a hind tibia and a hind tarsus.*

Length: ♀, 5 mm.; ♂, 3·5–4·5 mm.

Madagascar: Bekily, 4 ♀♀, 5 ♂♂, ix.1933 (*A. Seyrig*).

Type and cotypes in the Paris Museum; cotypes in the British Museum.

Host. This species is recorded to have been bred from the Aegeriid, *Epitarsipus rufithorax* le Cerf.

Cocoons white, elongate, from 5 to 11·5 mm., sometimes with the length as much as four times the greatest breadth; also, noticeably truncated at one end, and from this end emergence takes place, so that the circular flap cut by the emerging insect is quite flat. The sides of the cocoon at the truncated end often produced somewhat so that the flat terminal truncation is not visible when the cocoon is viewed from the side. In contrast, the other end of the cocoon sometimes quite considerably pointed.

This most interesting species is ridiculously close to *grandiculus* Wilkn., to which of course it runs in my key (1932, *Trans. ent. Soc.*, **80**: 326–343) as later revised (1934, *Stylops*, **3**: 151). One character whereby the two species may be separated, namely the colour of the female coxae, is immediately apparent; but whether this character is constant can only be shown by further series—I do not see why it should not be. There are also numerous, very small structural differences between the species—for example, in the relative lengths of the flagellum, in the strength and nature of the punctation on the mesonotum, and in the shape of the 2nd tergite; but admittedly these differences may be due only to size—but in this case I think not. The widely separated habitats are to be remarked; but it is quite possible that the hosts will prove to be closely related.

Couplet 107a is to be altered, as follows:—

107a.	Ovipositor sheaths not longer than hind femora; U.S.A.	*ornigis* Weed.
	Ovipositor sheaths elongate, considerably longer than hind tarsi .	107a/1.
107a/1.	Female with coxae black; Assam	*grandiculus* Wilkn.
	Female with coxae red testaceous; Madagascar . . .	*seyrigi* Wilkn.

Apanteles olivierellae sp. n.

♀♂. Black; the extreme apices of the four anterior femora, the front tibiae and tarsi, about the basal two-fifths of the four posterior tibiae, and the four posterior tarsi (except of course the feet), red testaceous; palpi and tibial spurs pale; wings hyaline, the setae white; the costal veins to some extent red testaceous; the pseudostigma, stigma, metacarp, 1st abscissa of radial, transverse cubital, and 2nd abscissa of cubital, brown, the remaining veins colourless; stigma uniformly opaque.

♀♂. *Head* large, obviously much broader than thorax between tegulae; face and clypeus throughout closely punctate (degree 2); the clypeus very strongly emarginate; the large facial depressions nearer to apex of clypeus than to the eyes; vertex and frontal occiput minutely punctate (degree 1), the frons largely entirely smooth and polished and with only some minute punctures; posterior ocelli nearer to each other than to the eyes; flagellum of ♂ just somewhat shorter than the combined length of head, thorax, and abdomen of ♀ shorter, about equal to the combined length of head, thorax, and the 1st tergite. *Thorax*

* The statement in my original description of *grandiculus*, to which species *seyrigi* is very closely related, that the ovipositor sheaths are longer than the combined lengths of a hind tibia and a hind tarsus is, I consider, incorrect. It is difficult, of course, to say without dissection but I think now they should be described in the same way as those of *seyrigi*.

not wider between tegulae than thick dorso-ventrally; mesonotum and disc of scutellum throughout regularly punctate (degree 2); the non-excavate area of the lateral faces of the scutellum clearly reaching up beyond half-way to base of scutellum; propodeon smooth, polished, unsculptured save for some extremely minute punctation basally on each side. *Wings*: the radial vein about equal to, and hardly angled with, the transverse cubital, distinctly shorter than the breadth of the stigma; stigma longer than metacarp. *Legs*: hind coxae minutely punctate (degree 2), small, hardly longer than the 1st tergite; hind tibial spurs equal in length, half the length of the basal joint of the hind tarsus. *Abdomen* (figs. 2 and 3): 1st tergite in basal half slightly excavate, in apical half only very slightly

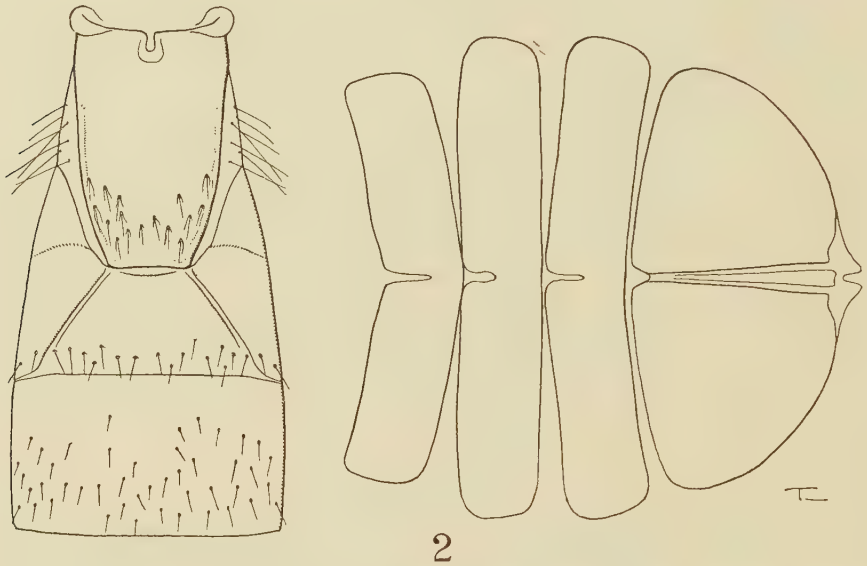

Fig. 2.—*Apanteles olivierellae* sp. n.; the three basal tergites, and, somewhat reduced, the apical ventrites, dorsal view, female.

turned over, in about the apical third with some weak aciculation and punctation, otherwise entirely smooth and polished; both the 2nd and the 3rd tergites minutely punctate across the apical third, otherwise entirely smooth and polished; succeeding tergites with the usual minute punctation; ventrites of ♀ with median longitudinal suture, the 3rd to 5th ventrites in addition with the anterior two-fifths or half of the median line cut out; ovipositor sheaths in length rather shorter than the hind femora, about equal to the combined length of the three basal joints of the hind tarsus, broad, strongly setiferous, basally above with a patch of microscopically fine hairs and bristles which serve to hold together the two sheaths; hypopygium to some extent membranously acute.

Length, 2·5 mm.

Algeria: Philippeville, 15 ♀♀, 4 ♂♂, iii.1932[*sic*].

Type in the British Museum.

Host. The material is labelled to have been bred from galls of the Tineid *Amblypalpis olivierella* Rag., on *Tamarix gallica.*

Cocoons unknown.

This material bears the British Museum Register Number 1932–90, and is recorded in the Register to have been presented by M. l'Inspecteur de la Défense des Cultures, Algiers, under the date 29.ii.1932[*sic*].

This is an altogether remarkable species of *Apanteles*, since it possesses more than one character not previously described in the genus, for example, the strongly emarginate clypeus, the form of suturing in the preapical ventrites, and the spines at the base of the ovipositor sheaths.

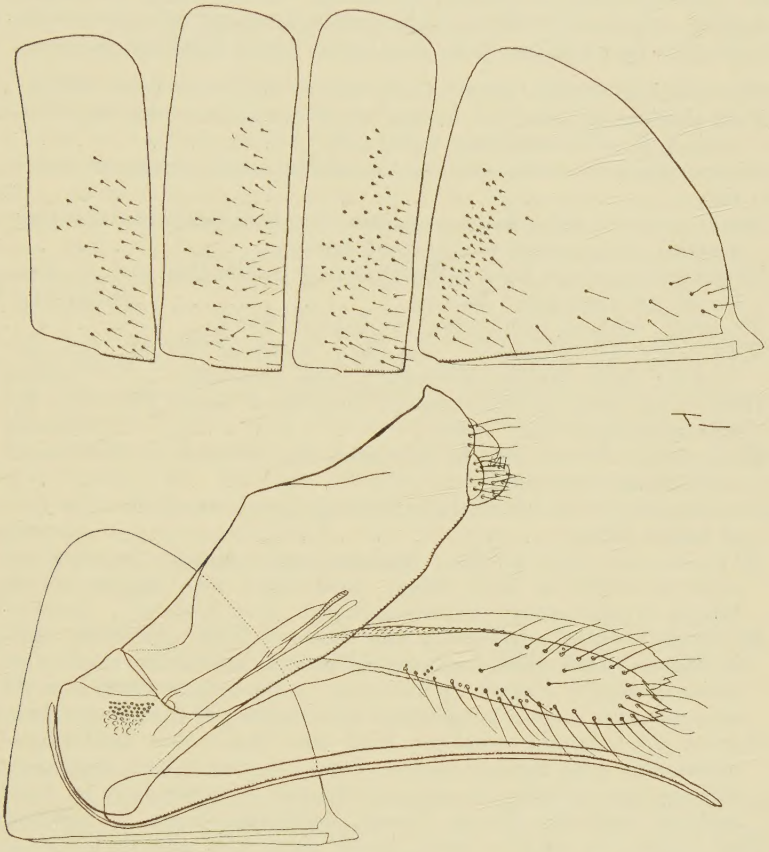

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FIG. 3.—*Apanteles olivierellae* sp. n.; the apical ventrites and genitalia, lateral view, female.

The host, in addition, is remarkable. I thought for a long time that this *Apanteles* I have here described as new would prove to be *gallicolus* Giraud, a species also described from northern Africa and also from a gall-making Lepidopterous host; but one glance at the type of this latter, which is in the Paris Museum, was enough to show me that *olivierellae* and *gallicolus* are abundantly distinct. It will remain to be shown, however, by dissection, when I have obtained material, whether *gallicolus* has the same remarkable characters in the ventrites and ovipositor sheaths that I have described and figured above for my new species.

Apanteles Group G : additional species.

Some two years ago I erected a new Group (1934, *Stylops*, **3** : 155–156) for species of *Apanteles* that were much flattened dorso-ventrally, and I gave to it

the arbitrary distinguishing letter G. Since that time I have become acquainted with two further species that are quite clearly referable to this Group, and I cannot refrain from publishing the short key again so as to include these two species, particularly since one of them, namely *thompsoni* Lyle, had been referred by me previously to another Group of the genus. Material of the other species, *impunctatus* Mues., quite lately came into the possession of the British Museum by exchange from the United States National Museum.

204. First abscissa of radial short, clearly shorter than transverse cubital . 205.
First abscissa of radial not unduly short, not shorter than transverse cubital, possibly sometimes equal to it . . . . . 210.

205. Mesonotum with strong, definite, exceedingly well separated punctation . . . . . 206.
Mesonotum with only minute punctation (except possibly round anterior margin), or in greater part entirely smooth . . . . . 208.

206. Propodeon in at least basal half with median longitudinal carina; mesonotum red testaceous; Europe . . . . . *ferrugineus* Marsh.
Propodeon without such carina; mesonotum black . . . . . 207.

207. Hind coxae red testaceous; propodeon declivous behind; face prominent; India, Malaya, Formosa, Japan, Australia . . *flavipes* Cam.
Hind coxae black except at apex; propodeon nearly flat; face not especially prominent; Japan . . . . . *chilocida* Vier.*

208. First tergite with base broader than apex, the sides more or less straight and regularly converging . . . . . 209.
First tergite not so describable, definitely broader towards apex than at base; Africa . . . . . *sesamiae* Cam.

209. All femora very much swollen; hind tarsi rather shorter than or about equal in length to hind tibiae; mesonotum with regular minute (degree 1) punctation; propodeon rugose; New Zealand . *demeter* Wilkn.
All femora swollen, particularly hind femora; hind tarsi about equal in length to hind tibiae; mesonotum entirely smooth save for an occasional minute (degree 1) puncture; propodeon entirely smooth save for some median longitudinal aciculations; U.S.A. *impunctatus* Mues.
Femora not noticeably swollen; hind tarsi longer than hind tibiae; mesonotum with regular, minute (degree 1) punctation; propodeon entirely smooth save for minute (degree 1) punctation in basal half and medianly; Europe, Russia, Manchuria, Japan *thompsoni* Lyle.

210. First tergite very narrow, with parallel sides, and with its length at least three times its breadth; Philippines, Malaya . *angustibasis* Gahn.
First tergite not so describable . . . . . 211.

211. Mesonotum entirely smooth save for an occasional minute puncture; hind tarsi about equal in length to hind tibiae; U.S.A. *impunctatus* Mues.
Mesonotum not so describable; hind tarsi considerably longer than hind tibiae . . . . . 212.

212. Second tergite of female with its discal sulci equal to or longer than its basal breadth; Uganda . . . . . *afer* Wilkn.
Second tergite of female with its basal breadth twice or approaching twice length of its discal sulci; West Indies . . . . *diatraeae* Mues.

Microgaster papua sp. n.

♀♂. Red testaceous; feet, ovipositor sheaths, and a patch on the scape, black; flagellum very dark brown; apex of hind tibiae weakly, and whole of hind tarsi strongly, darkened; both wings strongly infumated throughout, apparently not (or but hardly) more strongly so apically than basally; wing-veins and stigma very dark brown.

* Not known to me.

♀♂. *Head*: face, clypeus, and labrum, not unusually elongate, minutely punctate; facial depressions rather nearer to eyes than to apex of clypeus; posterior ocelli rather nearer to each other than to the eyes. *Thorax*: mesonotum in the anterior half strongly punctate, in the posterior half distinctly more weakly punctate; scutellar sulcus straight; disc of scutellum minutely punctate; mesopleurae punctate anteriorly and below, otherwise entirely smooth, with the mesopleural sulcus punctiform or nearly so; propodeon with a strong, median, longitudinal carina, otherwise smooth save for some weak punctation basally.* *Wings* remarkably similar to those of *M. apo*, and apparently differing therefrom only in the 2nd transverse cubital, which is more usually shorter than that of *M. apo* and received in the 1st transverse cubital only a little above the middle. *Legs*: hind coxae in upper half smooth except for some minute scattered punctation; the longer hind tibial spur three-fifths, and the shorter spur less than a third, the length of the basal joint of the hind tarsus. *Abdomen*: 1st tergite in basal half excavate and entirely smooth, in apical half turned over, and in the basal half of the apical half in the ♂ with some, in the ♀ with numerous, strong punctures; in shape the 1st tergite is very similar to that of *M. psarae* Wilkn., its apex being not drawn out to a more or less attenuated truncate apex as in *M. apo*, but its truncate apex in the ♀ being very definitely greater than, and in the ♂ about equal to, the median length of the 2nd tergite; 2nd tergite smooth save for two rows of minute punctures across the apex, in the ♀ with its median length less than its basal breadth, and its straight sulci diverging much more widely than in ♀ of *apo* but not so widely as in *psarae*, in ♂ with its median length about equal to its basal breadth, and its straight sulci diverging at an angle of 90°; 3rd tergite entirely smooth in the basal half, minutely punctate in the apical half, in both sexes very definitely longer than the 2nd tergite, in the ♀ with its length about equal to the apical breadth of the 1st tergite; ovipositor sheaths apparently rather shorter than hind femora, without process.

Length, 4·0–5·0 mm.

Papua: Kokoda, 1200 ft., 1 ♀ (*type*), iv.1933, 3 ♀♀, iv.1933, vi.1933, ix.1933, 1 ♂, iv.1933, 5 ♂♂, ix.1933, 1 ♂, x.1933, Mafulu, 4000 ft., 1 ♂, i.1934 (*L. E. Cheesman*).

Type in the British Museum.

Host unknown.

Cocoons unknown.

This species is extremely close to *Microgaster apo* Wilkn., described from the Philippine Islands, to which it runs in my key to the Indo-Australian and Ethiopian species (1929, *Trans. ent. Soc. Lond.*, **77**: 99–101). It differs, however, in numerous small characters, but particularly in the shape of the 1st tergite; and this character I have used in the revised couplet, as below (p. 88).

Microgaster kokodana sp. n.

♀♂. Red testaceous; feet, ovipositor sheaths, and a patch on the scape, black; flagellum very dark brown; hind tarsi with apex of basal joint, and the four apical joints entirely, darkened; both wings basally infumated; in the fore-wing apically beyond the recurrent, and in the hind-wing in about the apical two-fifths, in the ♀ strongly, and in the ♂ very strongly, infumated; wing-veins dark brown, stigma very dark brown.

♀♂. *Head*: face, clypeus, and labrum not unusually elongate, minutely punctate; facial depressions nearer to apex of clypeus than to the eyes; posterior ocelli in ♀ nearer to each other than to the eyes, in ♂ about equidistant from each other and the eyes. *Thorax*: mesonotum in the anterior two-thirds strongly and closely punctate, in the posterior third

* This punctation is in fact exhibited also in *M. apo* Wilkn., despite my statement in the original description.

much more weakly and sparsely punctate, medianly in the posterior fourth with an area entirely smooth and slightly depressed; scutellar sulcus straight; disc of scutellum tumescent, entirely smooth; mesopleurae weakly punctate anteriorly and below, otherwise entirely smooth, with the mesopleural sulcus very shallow; propodeon apparently smooth save for a strong, median, longitudinal carina that is slightly crenulate down each side and which is clearly somewhat sunken, the cheeks of the propodeon being slightly tumescent. *Wings figured* (fig. 4): 1st transverse cubital unusually long. *Legs*: hind coxae on outer

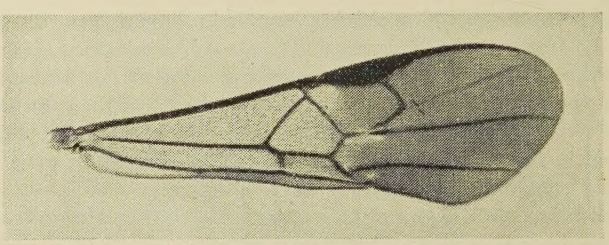

Fig. 4.—*Microgaster kokodana* sp. n.; fore-wing, female.

faces throughout with strong, circular, clean, separated punctures, otherwise smooth save for some strong, oblique carination apically above, and for minute punctation above at base; the hind tibial spurs elongate, the longer spur five-sixths, and the shorter spur half, the length of the basal joint of the hind tarsus; the longer spur is rather more than half the length of the hind tibia. *Abdomen*: 1st tergite more or less indefinitely sculptured, elongate, 2·5 times as long as its greatest breadth, which is in the apical half, much constricted in the basal half, its apex very strongly emarginate; 2nd tergite longer than the greatest breadth of the 1st, apparently entirely smooth save for its sulci which are rounded, weak, and only definitely apparent in the basal angles of the tergite; 2nd suture almost, if not quite, wanting; 3rd tergite longer than 2nd, smooth; succeeding tergites smooth; all tergites with some exceedingly minute setae in a row across apex, but none of the usual punctures visible; ovipositor short, strongly decurved, its sheaths of about the same length as the shorter hind tibial spur and without process.

Length, 4 mm.

Papua: Kokoda, 1200 ft., 2 ♀♀, viii.1933, 1 ♂, iv.1933 (*L. E. Cheesman*).
Type in the British Museum.
Host unknown.
Cocoons unknown.

Both this species and *Microgaster papua* sp. n. run in my key of the Indo-Australian and Ethiopian species (1929, *Trans. ent. Soc. Lond.*, **77** : 99–101) to couplet No. 11, which consequently should be altered, as follows:—

11. Ovipositor sheaths shorter than basal joint of hind tarsus . . . . 11a.
Ovipositor sheaths longer than basal joint of hind tarsus 11b

11a. Breadth of stigma greater than length of 1st abscissa of radial; Australia . . . . . *rixosa* Wilkn.
Breadth of stigma less than length of 1st abscissa of radial; Papua *kokodana* Wilkn.

11b. Apical breadth of 1st tergite in both sexes less than median length of 2nd tergite; Philippine Is. . . . . *apo* Wilkn.
Apical breadth of 1st tergite in ♂ about equal to, in ♀ very definitely greater than, median length of 2nd tergite; Papua . . *papua* Wilkn.